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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,455	07/10/2008	Marcel Lapointe	102003/18	1331
7590 Allan Williams PO Box 24001 Hazeldean RPO Kanata, Ontario, K2M 2C3 CANADA			EXAMINER WONG, LINDA	
			ART UNIT 2611	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/597,455	Applicant(s) LAPOINTE ET AL.	
	Examiner LINDA WONG	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 21, 22, 25 and 27 is/are rejected.
- 7) ☒ Claim(s) 9-13, 23, 24, 26, 28 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 November 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings were received on 11/25/2007. These drawings are accepted.

Claim Objections

2. **Claims 2-5** recite the limitation "the cursor and the pre-cursor" in claim 1. There is insufficient antecedent basis for this limitation in the claim.

Information Disclosure Statement

3. The US patent and publication references cited in the Search Report 11/25/2007 have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO/SB/08A and 08B form, must be filed within the set period for reply to this Office action.
4. The listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File

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Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Report have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-5** are rejected under 35 U.S.C. 102(b) as being anticipated by Salinger (US Patent No.: 6212229).

a. **Claim 1,**

i. Salinger et al discloses

- “an adaptive transmit equalizer to receive an outgoing serial data stream and provide launch data into the communication channel, the launch data

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equalized to transmit control parameters” (Fig. 3, label 38 as the adjustable pre-emphasis filter to receive an outgoing serial data stream (input from label 28) and provide data to the channel (label 12). The equalizer receives control parameters from label 52.)

- “an adaptive receive equalizer an incoming data stream from the communication channel and condition the received incoming data stream to produce an equalized output serial data stream in response to receive control parameters” (Fig. 3, label adaptive equalizer for filtering the incoming data stream (label 14), wherein the equalizer is adjusted according to the parameters of label 52.)
- “control means operable to control said adaptive transmit equalizer and said adaptive receive equalizer based on said incoming data stream” (Fig. 3, label 52)

- b. **Claim 2**, Salinger et al discloses “the adaptive transmit equalizer has a symbol spaced feed forward equalizer with two taps corresponding to the cursor and pre-cursor.” (Fig. 3, label 38 shows a FIR filter, wherein an FIR filter’s basic fundamental blocks will have taps to delay the signal, coefficients, multiplication of the a respective coefficient with the output of tap (cursor and pre-cursor) and summation of the output of the multiplication.) Although Salinger does not disclose the filter has two taps, it would have been obvious to one skilled in the art based on the design choice of the inventor the number of taps within the filter.

- c. **Claim 3**, Salinger et al discloses “the adaptive transmit equalizer has a two coefficient FIR filter symbol spaced feed forward equalizer with two taps correspond to the cursor and pre-cursor, the output of which is the launch data.” (Fig. 3, label 38 shows an FIR filter, wherein an FIR filter will have taps along with coefficients. An FIR filter’s fundamental building blocks will have taps to delay the signal, coefficients, multiplication of the a respective coefficient with the output of tap (cursor and pre-cursor) and summation of the output of the multiplication.) Although Salinger does not disclose the filter has two taps and two coefficients, it would have been obvious to one skilled in the art based on the design choice of the inventor the number of taps within the filter.
- d. **Claim 4**, Salinger et al discloses “the adaptive transmit equalizer has a symbol spaced feed forward equalizer with a tap corresponding to the cursor and M pre-cursor taps.” (Fig. 3, label 38 shows an FIR filter, wherein an FIR filter will have taps along with coefficients. An FIR filter’s fundamental building blocks will have taps to delay the signal, coefficients, multiplication of the a respective coefficient with the output of tap (cursor and pre-cursor) and summation of the output of the multiplication.) Although Salinger does not disclose the filter has two taps and two coefficients, it would have been obvious to one skilled in the art based on the design choice of the inventor the number of taps within the filter.
- e. **Claim 5**, Salinger et al discloses “the adaptive transmit equalizer has an M coefficient FIR filter that sums a portion of the cursor and the output of a symbol

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spaced feed forward equalizer with M taps each tap corresponding to a successively earlier pre-cursor up to the Mth pre-cursor to produce the launch data.” (Fig. 3, label 38 contains an FIR filter, wherein an FIR filter’s fundamental building blocks will have taps to delay the signal, coefficients, multiplication of the a respective coefficient with the output of tap (cursor and pre-cursor) and summation of the output of the multiplication.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 6,8,25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Salinger as applied to claim 1, in view of Liau et al (US Patent No.: 6650698).

a. **Claim 6,**

- i. Salinger discloses an adaptive receive equalizer (Fig. 1, label 68), but fails to disclose the composition of the adaptive equalizer.
- ii. Salinger fails to disclose all the limitations recited. Liau et al discloses “the adaptive receive equalizer includes an adaptive linear equalizer in combination with an adaptive non-linear decision feedback equalizer (DFE) to condition the received incoming data into said equalized output serial data stream.” (Fig. 5, label 510 as a linear equalizer, label 516 as a non-

linear decision feedback equalizer to condition the received signal (input from label 508) and output from label 502 as the equalized output serial data stream.) It would have been obvious to one skilled in the art at the time of the invention to build the adaptive equalizer as shown in Salinger as disclosed by Liao et al so to compensate for linear and non-linear distortions, thus preparing the signal for further processing.

- b. **Claim 8**, Liao et al discloses “said DFE has a plurality of symbol spaced taps, each of which can be programmed independently.” (Fig. 5, label 516 shows a decision feedback equalizer, wherein a plurality of symbol spaced taps would be found within the DFE. The abstract discloses updating the DFE. This indicates the taps can be programmed or adjusted or updated.)

c. **Claim 25**,

- i. Salinger et al discloses
- “using an M tap feed forward equalizer to shape an outgoing data stream into a launch data stream based on a respective pre-cursor symbol tap parameter $C_m \dots C_1$ and a symbol tap parameter C_0 ” (Fig. 3, label 38 as the adjustable pre-emphasis filter to receive an outgoing serial data stream (input from label 28) and provide data to the channel (label 12). The equalizer receives control parameters from label 52. The fundamental building blocks of a filter or equalizer will have C_m - C_0 taps or coefficients multiplied with the input signal to produce pre-cursor symbol tap and cursor symbol taps.)

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- “supplying the launch data stream to the communication channel” (Fig. 3, label forward transmission path)
 - “receiving an incoming data stream from the communication channel” (Fig. 3, label reverse transmission path)
 - “conditioning the received incoming data stream by passing the incoming data stream through an adaptive filter” (Fig. 3, label 62)”
 - “sampling the equalized serial data stream to latch user data” (Fig. 3, label A/D produces the latch user data.)
 - “sampling the equalized serial data stream to latch monitor data” (Fig. 3, label 70 as the symbol decoder or slicer for deciding the symbols or bits of the received signal.)
 - “producing the tap parameters from the user data and monitor data” (Fig. 3, label 72 outputs a signal to the transceiver control computer for generation of the taps for the adaptive equalizer (labels 68 and 38).)
- ii. Salinger fails to disclose all the limitations recited.
- iii. Liao et al discloses wherein the adaptive filter comprises “an adaptive linear equalizer and N tap decision feedback equalizer (DFE) with corresponding symbol spaced tap parameters to produce an equalized serial data stream.” (Fig. 5, label 510 as a linear equalizer, label 516 as a non-linear decision feedback equalizer to condition the received signal (input from label 508) and output from label 502 as the equalized output serial data stream.) It would have been obvious to one skilled in the art at the time of the invention

to build the adaptive equalizer as shown in Salinger as disclosed by Liao et al so to compensate for linear and non-linear distortions, thus preparing the signal for further processing.

7. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Salinger as applied to claim 1, in view of Liao et al (US Patent No.: 6650698), further in view of MacTaggart et al (US Publication No.: 20030218502).

a. **Claim 7**,

- i. Salinger discloses an adaptive receive equalizer (Fig. 1, label 68), but fails to disclose the composition of the adaptive equalizer.
- ii. Liao et al discloses a linear equalizer in combination with an adaptive non-linear decision feedback equalizer. (Fig. 5, label 510,516)
- iii. Salinger in view of Liao et al fails to disclose the composition of the linear equalizer.
- iv. MacTaggart et al discloses "wherein said linear equalizer includes two distinct signal paths to condition the received incoming data, one signal path is a controllable pure gain stage and the other signal path is independently controllable pure gain stage coupled to a high pass filter, the combined output of both is gain adjusted and supplied" for further processing. (Fig. 3, label 305 as the high pass filter (paragraph 34), label 310 as the variable gain amplifier for adjusting the gain, wherein the combination of the two is considered one path. The other path comprises

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label 320, a variable gain amplifier. Summation of the two paths is performed by label 315.) It would have been obvious to one skilled in the art at the time of the invention to build the linear equalizer, disclosed by Liau et al, as disclosed by MacTaggart et al so to adjust frequency of the equalizer and prevent errors caused by the equalizer.

8. **Claims 21-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Salinger (US Patent No.: 6212229) in view of Bliss et al (US Patent No.: 5966415).

a. **Claim 21,**

i. Salinger et al discloses

- “an equalizing an outgoing serial data stream to provide launch data into the communication channel in response to transmit control parameters” (Fig. 3, label 38 as the adjustable pre-emphasis filter to receive an outgoing serial data stream (input from label 28) and provide data to the channel (label 12). The equalizer receives control parameters from label 52.)
- “conditioning an incoming data stream received from the communication channel to produce an equalized output serial data stream in response to receive control parameters” (Fig. 3, label 62, equalizer, conditions the incoming data stream, label reverse transmission path, received from the communication channel, label 10.)

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- “recovering the serial data stream from the equalized output serial data stream” (Fig. 3, label 70 and 72 decodes the signal to recover the equalized output serial data stream.)
- ii. Salinger fails to disclose all the limitations.
- iii. Bliss et al discloses
 - “producing a symbol spaced error signal indicative of a difference between the equalized output serial data stream and a desired value over a symbol period” (Col. 4, lines 40-67 discloses the sample error is produced from difference between the actual and ideal frequency response. The filter receives an input of sample values or a symbol within a period of time (sampled time).)
 - “using the error signal to produce” parameters (Col. 4, line 55 shows the equation for updating the filter coefficients.)
- iv. Bliss et al fails to disclose the parameters are “the transmit control parameters and the received control parameters”. (Col. 9, lines 35-61 discloses the TCC 52 computes the difference and the difference is used to produce transmit control parameters and receive control parameters. (The TCC regulates the receive power and transmit power.)) It would have been obvious to one skilled in the art at the time of the invention to calculate parameters as disclosed by Bliss et al in Salinger’s invention so to compensate for time-varying characteristics.

b. **Claim 22,**

- i. Bliss et al discloses
 - “over a plurality of symbol periods: storing the recovered serial data stream in a data channel word” (Fig. 4b, label 122 shows the output of the slicer, wherein the output of the slicer would a set of samples or bits or words. Col. 4, lines 40-67 discloses the equalizer filters sample values or bits, wherein the sliced output would be a portion of the sample values or bits passed into the equalizer. The sliced output also acts as a command for filter adjustment (Fig. 7, label 122 and Wk).)
 - “storing the error signal produced in a monitor channel word” (Col. 4, lines 40-67 discloses the sample error is produced from difference between the actual and ideal frequency response. The error is used as a command to update the coefficients of the filter as shown in Fig. 7.)
 - Producing updates to the equalizer based on the error signal and recovered serial data stream. (Col. 4, line 55 shows the equation for updating the filter coefficients.)
- ii. Bliss et al fails to disclose all the limitations.
- iii. Salinger et al discloses “producing the transmit control parameters and the receive control parameters” the output of the equalizer. (Fig. 3, label 52 for producing adjustments for filters 38 and 62 based on the output of the equalizer, label 38 and 72.) It would have been obvious to one skilled in the art at the time of the invention to calculate parameters as disclosed by Bliss

et al in Salinger's invention so to compensate for time-varying characteristics.

c. **Claim 23,**

i. Salinger et al discloses

- the FIR filter (Fig. 3, labels 44 in the receiver and label 42 of the transmitter) coefficients are determined for a window-based digital finite impulse response of predetermined length. (Col. 11, lines 12-35)
- Salinger fails to disclose the rest of the limitations. Bliss et al discloses a data channel word and monitor channel word wherein the computation of these words are based on the filter output. The filter output is dependent on the coefficient or composition of the filter. If the filter output is windowed, the words will also be windowed. (Fig. 4, label 122 as the data control word and Col. 4, lines 40-67 discloses a sample error or monitor channel word.) It would have been obvious to one skilled in the art at the time of the invention to output control words as disclosed by Bliss et al in a windowed FIR filter environment as disclosed by Salinger so to effectively allow for efficient adjustments of the filter within a period of time.

d. **Claim 24,** Salinger et al discloses a window or bit offset based FIR filter. (Col. 11, lines 12-35) Although Salinger et al fails to disclose a pseudo random window or an interchangeable window, it would have been obvious to one skilled in the art to provide an interchangeable window as opposed to a

predetermined window so to increase robustness and allow for efficient error adjustment.

9. **Claims 27-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Salinger in view of Liao et al (US Patent No.: 6650698), further in view of Bliss et al (US Patent No.: 5966415).

a. **Claim 27,**

i. Bliss et al discloses

- “over a plurality of symbol periods: storing the recovered serial data stream in a data channel word” (Fig. 4b, label 122 shows the output of the slicer, wherein the output of the slicer would a set of samples or bits or words. Col. 4, lines 40-67 discloses the equalizer filters sample values or bits, wherein the sliced output would be a portion of the sample values or bits passed into the equalizer. The sliced output also acts as a command for filter adjustment (Fig. 7, label 122 and Wk).)
- “storing the error signal produced in a monitor channel word” (Col. 4, lines 40-67 discloses the sample error is produced from difference between the actual and ideal frequency response. The error is used as a command to update the coefficients of the filter as shown in Fig. 7.)
- Producing updates to the equalizer based on the error signal and recovered serial data stream. (Col. 4, line 55 shows the equation for updating the filter coefficients.)

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- ii. Bliss et al fails to disclose all the limitations.
 - iii. Salinger et al discloses “producing the transmit control parameters and the receive control parameters” the output of the equalizer. (Fig. 3, label 52 for producing adjustments for filters 38 and 62 based on the output of the equalizer, label 38 and 72.) It would have been obvious to one skilled in the art at the time of the invention to calculate parameters as disclosed by Bliss et al in Salinger in view of Liao et al’s invention so to compensate for time-varying characteristics.
- b. **Claim 28,**
- i. Salinger et al discloses
 - the FIR filter (Fig. 3, labels 44 in the receiver and label 42 of the transmitter) coefficients are determined for a window-based digital finite impulse response of predetermined length. (Col. 11, lines 12-35)
 - Salinger fails to disclose the rest of the limitations. Bliss et al discloses a data channel word and monitor channel word wherein the computation of these words are based on the filter output. The filter output is dependent on the coefficient or composition of the filter. If the filter output is windowed, the words will also be windowed. (Fig. 4, label 122 as the data control word and Col. 4, lines 40-67 discloses a sample error or monitor channel word.) It would have been obvious to one skilled in the art at the time of the invention to output control words as disclosed by Bliss et al in a windowed FIR filter

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environment as disclosed by Salinger so to effectively allow for efficient adjustments of the filter within a period of time.

- c. **Claim 29**, Salinger et al discloses a window or bit offset based FIR filter. (Col. 11, lines 12-35) Although Salinger et al fails to disclose a pseudo random window or an interchangeable window, it would have been obvious to one skilled in the art to provide an interchangeable window as opposed to a predetermined window so to increase robustness and allow for efficient error adjustment.

Allowable Subject Matter

10. **Claims 14-20** are allowed over prior art.
11. **Claims 9-13,26** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINDA WONG whose telephone number is (571)272-6044. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Linda Wong
12/18/2009

/David C. Payne/
Supervisory Patent Examiner, Art Unit 2611